Microlocal Analysis with Tight Multiwavelet Frames

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Following Ryuichi Ashino's microlocal analysis program with multiwavelets, two constructions of tight multiwavelet frames in $L^2(\mathbb{R}^\times)$ adapted to microlocal analysis, or microlocal filtering, are presented. The question of an MRA (multiresolution analysis) for these frames is still open. Microlocal filtering can also be considered to be the action of pseudodifferential operators whose symbols are smooth functions with compact supports in Fourier space. Expansion of functions or signals in terms of tight multiwavelet frames gives a rough estimate of their microlocal content. Examples are presented of numerical microlocal analysis of functions and images. This is a joint work with Ryuichi Ashino, Christopher Heil and Michihiro Nagase.